A change in University Lecturers' Perception of E-learning tools for Instructional Delivery at Midlands State University: From techno-phobic to technology savvies

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Abstract

Midlands State University (MSU) has witnessed an about turn in lecturers' perceptions and beliefs about technology from being negative to positive enthusiastic users of technology. Using the case of MSU this paper reports interplay of factors that have resulted in lecturers' buy-in in the use of e-learning as a mode of instructional delivery. The study employed Actor Network Theory (ANT) as both a methodological and analytical framework to trace the trajectory of the e-learning programme at MSU. The conspicuous actors were followed using questionnaires, participant observation, and document analysis as well as tracing actors through the trails they left on the e-learning platform. The results show that there are heterogeneous actants which have exerted their agencies on lecturers through multiple associations they created during the implementation of the e-learning programme which has resulted in the lecturers' change in perception from being techno-phobic to become technology savvies. This article contributes to the growing body of literature that uses ANT to understand e-learning as a socio-technical process. ANT's contribution to explaining the change in lecturer's perception is its symmetrical power that can be used to consider technological developments and the human capacity development as equal actants that can exert similar levels of influence on each other to bring about the required change.

Keywords: e-learning, perception, lecturers, techno-phobic, savvies , Zimbabwe

1. Introduction

Information communication technology (ICT) is generally accepted as a modern instructional tool that enables educators to modify the teaching methods they use in order to increase student learning. The use of ICT in education aims to improve the quality of teaching and learning as well as democratise access to education. For any university to remain globally competitive it is essential for them to change the traditional way of delivering education in order to respond to the rapidly changing conditions in technology and society (Lee & Yeap, 2009). As a result of the fast developing internet and ICT technologies, universities world over are under pressure to adopt e-learning systems to assist in their instruction. E-learning is generally accepted as a modern instructional process that enables educators to modify the teaching methods they use in order to increase student learning.

Higher education in Zimbabwe will not continue to progress without taking Information Communication Technology (ICT) and e-learning in particular, into

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consideration.Zimbabwe's Information Communication Technology (ICT) Policy (2005) places a premium on the importance of ICTs in education and human resource development and emphasises the promotion of equitable access to ICT to enable education and training in all parts of the country, including the disadvantaged communities. The policy highlights the need to build skills in the sector, promoting software development, e-learning and embedding of ICT literacy in the pedagogy of schools, colleges and universities. Before the national ICT policy, the Nziramasanga (1999) Education Commission Report had recommended the introduction and mainstreaming of computer based teaching and learning in the pedagogy of schools, colleges and institutions of higher learning. It is clear from these observations that e-learning is destined to become part of the process of teaching and learning at schools and universities in Zimbabwe.

Although there are glowing statistics and success stories of e-learning adoption elsewhere in the world, the Zimbabwean situation remains below expectation and many key players, including lecturers in the education sector are still apprehensive about technology adoption (Chiome, 2013). Issues pertaining to e-learning are still a new phenomenon in the Zimbabwean education system. E-learning has not yet been developed to its full potential. Universities in Zimbabwe are still grappling with the new technological development, trying to see how it might be used to create a powerful learning environment. Nevertheless, in the last few years, the situation has begun to improve significantly. Many universities in Zimbabwe have taken a keen interest in e-learning and most universities are putting in place the relevant ICT infrastructure and emphasis on developing e-learning platforms (Chitanana, Makaza, & Madzima, 2008). Recently, the Zimbabwe Research and Education Network (ZimREN) was established to put in place a robust fibre-optic backbone dedicated to academic and research activities in institutions of higher learning. In addition, ZimREN is expected to use its collective bargaining power advantage that it brings to negotiate improved bandwidth at a more affordable cost and to coordinate the development of national network infrastructures (Harle, 2010).

However, it cannot be assumed that the provision of technical infrastructure will somehow cause lecturers to use it successfully to enhance their teaching and student learning. It does also not follow that the mere definition of policy in this area will cause the desired result, as first the new ideas have to be adopted by all those involved. Many factors act to determine how e-learning is accepted by key players at the institutions. This paper seeks to examine the factors that have led to the successful e-learning and ICT adoption at Midlands State University. This is done to trace the trajectory that is described by the lectures during their translation from techno-phobic to being technology savvies. The approach used is one involving actor-network theory because of the combinations of both human and non-human actors involved in e-learning. In this paper, the main actors are identified, and the role they play in changing the lecturers' views and use of e-learning, and how they have attempted to convince others to join them in the use of e-learning as a mode of instructional delivery.

2. Purpose of the study

The aim of the study was to explore the e-learning dynamics that have resulted in the change in perceptions of lecturers at Midlands State University (MSU). The study addressed the following research question: What are the factors that are at play in the implementation of e-learning at MSU? The focus of the study was to explore the linkages between the social, technical and natural factors that have resulted in the change of lecturers' perception and their use of e-learning from a technophobic situation to the current technology savvies.

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

3. Theoretical Framework

In this section I put forward an argument about how Actor Network Theory (ANT) can offer a unique lens for understanding how universities can organise and implement successful e-learning programmes. ANT provides a messy of research methodology and a theoretical framework that can be used to study complex phenomena such as the adoption and sustainable use of e-learning in universities. ANT has a unique vocabulary that distinguishes it from other science and technology theoretical foundations which may be used to study e-learning. For this study the most relevant are its ideas of heterogeneous networks, actants and sociology of translation. In this section I give a brief introduction of these concepts and show their relevance to the study of e-learning.

1.1 Actor network theory

ANT was developed within scienceand technology studies (STS) by Michel Callon, Bruno Latour, and John Law during the course of the 1980s as a recognition that actors build networks combining technical and social elements and that the elements of these networks, including those entrepreneurs who have engineered the network, are, at the same time, both constituted and shaped within those networks(Callon, 1987). Unlike many other STS theories,ANT assumes that socialpractice involves networks that consist of thingsworking together, and argues that successful social practice is the result of "a process of 'heterogeneous engineering' in which bits and pieces from the social,the technical, the conceptual, and the textual are fitted together"(Law, 1992, p. 380). The idea of heterogeneity refers to the bits and pieces that make the network, which might includepeople, technologies, materials, processes, and so on.

As a theoretical framework, ANT is committed to symmetrical analysis, a principle which holds that the material and non-human elements of any network should be treated analytically in the same way as the social and human elements (Latour, 1992). ANT provides a set of tools, sensibilities and methods of analysis that treat everything in the social and natural worlds as a continuously generated effect of the webs of relations within which they are located.It assumes that nothing has reality or form outside the enactment of those relations. (Fenwick & Edwards, 2010; Law, 2007a). Thus, ANT aims at exploring how humans with things in order to sustain(or fail to sustain) social processes. Its object of analysis is not to explain the size of any network, but rather to elucidate how any network grows in influence and/ or contracts. The analytical interest is to illuminate the processes, rather than explain end results, such as the size of a network at any point in time (Callon & Latour, 1981).Thus, ANT provides a promising perspective to holistic studies that focus on complex networks of heterogeneous actors, including people, ideals, symbolic constructions, and material elements which are seen as equally important elements during analysis.

1.2 Moments of Translation

Translation is the central process through which any network expands or contracts. The notion of translation is therefore an important tool that can be used to describe and analyse how an actor-network grows, changes and stabilizes (or not) during the process of e-learning implementation. Translation suggests that the effectiveness of the deployment of the technology is dependent on how the actor-network comprising of both the human and nonhuman actants is created and strengthened overtime (Callon, 1986; Latour, 1999). In every network there are continuous chains of translations which take place along its links to align and keep the actors involved and to create and stabilise the actor-networks (Latour,

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

1987). Translation leads to the alignment of the different actors and gradual institutionalisation or routinisation of information systems such as e-learning programmes which ultimately lead to development of durable networks (Braa, Monteiro, & Sahay, 2004). Callon, (1986) identifies four moments of translation, namely problematisation, interessement, enrolment, and mobilisation which are critical to the development of networked processes like e-learning. The unfolding of these moments of translation is driven by principal actors in the network. Every actor network has such actors who are crucial for the creation and development of the network. During the problematisation momentthe principal actors in a network strive to make themselves indispensable to the other entitiesby defining the nature of the problem and forcing or persuading other actors to accept the meaning which they will have attached to the problem at hand. At the second stage, interessement**,** the principal actors lock other actors into place by imposing themselves and defining the linkages between others. Enrollmentinvolvesthe principal actors defining the roles that the other actors in the network are supposed to play as well as defining the way in which actors will relate to one another within the network. The final moment, mobilization**,** involvesthe principal actors using the power of their passive agent allies in the network to make themselves the representatives or spokespeople for the network. Table 1 summaries the four moments of translation.

Table 1: Summary of the moments of translation

Problematisation	The primary actor defines the problem, the solution and identifies the relevant actors.
Interessement	The primary actor convinces other actors that its solution is better than other solutions.
Enrollment	Roles are assigned to the actors accepting the solution.
Mobilization of Allies	Actors become spokespersons.

In a successful actor-network, the actants manage to reach agreement and associate through translations to join forces and are able to reach a common definition of the problem. The network aligns its actors who otherwise have different initial agendas. Conversely, unsuccessful processes of translation weaken the actor-network (Callon, 1991). Callon (1986) introduces convergence and irreversibility as critical elements of successfully networks. According to Callon (1986) "Convergence measures the extent to which the process of translation and its circulation of intermediaries leads to agreement". This involves alignment, or the extent to which translation "*generates* a shared space, equivalence and commensurability" (Callon, 1986). Even though there aresome developments which may be in principle contingent and reversible, most successful translationsreach a moment of irreversibility(Callon, 1991), where it becomes impossible to go back to a point where that translation needs to start afresh. This argument is relevant to the introduction and sustenance of educational programmes such as e-learning in university education where the continued use and development of the programme are expected. The black boxed e-learning programme will only need to be reopened to see how the parts that it is made out of can be further strengthened.

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

1.3 A brief literature review on e-learning implementation

There is not much research in Zimbabwean Universities on the adoption of e-learning from a socio-technical perspective. There is very little literature that addresses the technical aspect of e-learning on a socio-technical agency basis. Instead, the technological determinist and the social determinist accounts dominate debates and adoption decisions (Mlitwa, 2005). These approaches maintain asymmetry between technology and the human actors in their analysis. For example studies byChitanana, L. (2008) and Chitanana et al (2008) tried to shed light on the state of e-learning at universities in Zimbabwe from lecturers' perspective. The study by Chitanana (2008) which assessed the adoption of e-learning at Midlands State University (MSU) shows that e-learning has started at a very low pace. Lack of a critical mass of early users, who understand the value of e-learning in university teaching was identified as a major challenge to the adoption of e-learning. This study argues that perception of lecturers and the speed at which they embrace e-learning depends on their level of understanding of e-learning technology. However for lecturers' perception to be fully understood, their interaction with all the other critical players in e-learning need to be explored using the same lens of analysis.

In recent years, however, there has been a growing body of literature that uses ANT to reconcile conflicting perspectives on the position of learning technologies in social processes(Mlitwa & van-Belle, 2010; Trusler & Belle, 2005). The ultimate position should be that e-learning should be conceptualised and treated as socio-technical networks. This view will enable coherent engagements between humans (educators, students, administrators), structures (learning groups, educator groups, institutions, policies), technology (computers, e-learning platforms), and the learning processesin the network. Such an approach will contribute significantly towards fully understanding how lecturers can effectively implement e-learningwithin varying contexts in which they are found.

Nevertheless, a snap view of literature shows that in many cases the adoption of e-learning at universities is mainly a result of decisions taken by the top management and imposed on educators. This compulsory intake will result in very minimal engagement with the system by academics(van-der-Merwe, 2004). Mlitwa (2005) notes that at some institutions, there are no policies or forum among the community of users to engage the choice of e-learning systems. The trend in Southern Africa has been that e-learning and the adoption of learning management systems (LMS) is driven and championed by directors of Information Communication Services (ICS). These approaches privilege technology and its affordances, which are taken as a given. There is no full interactive engagement between the social and the technical actors in such e-learning environments. There is a minimal literature giving a satisfactory account of the interwoven relationshipbetween technology and organisational transformations in e-learning (Mlitwa, 2005).

4. Methodology

The methodology employed in this study is based on the Actor network theory (ANT) framework (Latour, 2004; Latour & Woolgar, 1986; Law, 2007b). ANT is theoretical framework which describes the world as a network of hybrid of both the social and technological actants. ANT's postulation that the social and technological aspects should be studied on an equal footing is most productive when applied to cases in which the social and technological are embedded in each other (Elbanna, 2009) like in e-learning programmes. ANT allows researchers to study both people and technologies using the same tools.

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

Data collection methods used in the research were meant to follow the actors (Latour, 2005). These included semi-structured interviewswith lecturers, chairpersons of departments, university administration, ICT directors and technicians, review of documentation such asUniversity strategic plans, Senate meeting minutes and reports, University websites, discussion forum and blog posts and participatory observation. Google analytic was also used to trace users as they interacted with e-learning resources of various types including e-journals and e-books. Actors were also followed through the trails they left on the discussion forms of the e-learning portal. This messy of methods were used because large amount of data were needed to assemble the e-learning network.

The ANT analysis in this study is based on the careful reading of textual documents such as transcripts of interviews, documents such as University strategic plans, Senate meeting minutes and reports, University websites, discussion forum and blog posts, academic articles, and various other reports were also followed. The texts were analysed for references to associations and ties that were formed among the actants in the e-learning network. Following several iterations of analysis, one complex network was drawn (see figure 1). Due to the large number of actants and possible relationships, a two-dimensional matrix was used to explore all possible relationships between each pair of actants. The results are presented in the next section.

5. Findings

In this section the findings of the study are presented. The use of ANT as both methodological and analytical lens entails that e-learning is taken as a socio-technical network that comprises of both human and non-human actors. Hence the focus of data analysis was to identify the principle actors and to map out the assemblage of the associations and ties they created which have influenced the change of lecturer's perception of e-learning at MSU.

1.1 Identification of actants

The first task of an ANT analysis is to identify the actors and the problem they are trying to solve. The analysis of the data revealed that the e-learning network at MSU comprise of various conspicuous actants which included, the human actors (lecturers, students, ITC staff, university administrators), structures (Departments, Senate, library, institutional policies) and technology (computers, internet connectivity, computers networks, e-learning systems). These actors through their agency are involved in multiple associations or ties that have resulted in a fairly stabilised and hence successful e-learning programme that has turned lecturers from their initial technophobic tendencies to being technology savvies. Figure 1 shows an assemblage of the web of ties and associations that the actors created during their interaction in the implementation of the university's e-learning programme.

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

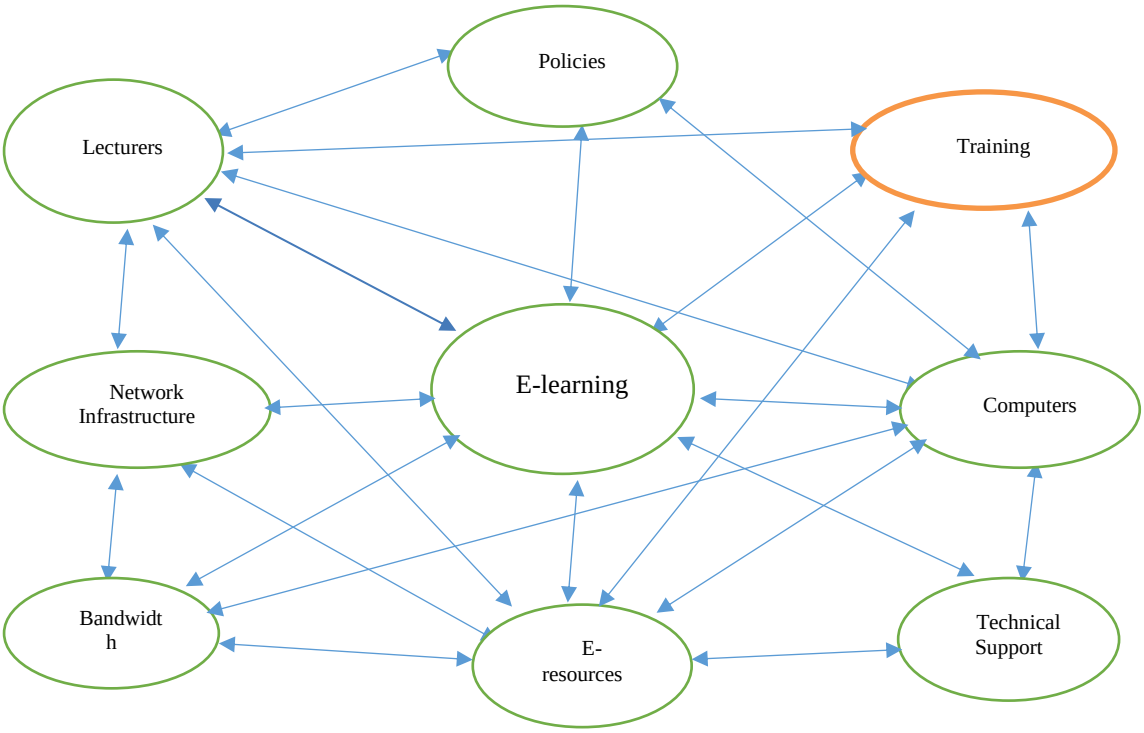

Figure 1: MSU e-learning actor network associations

1.2 Mapping the essential factors

1.2.1 ICT Network infrastructure

The university started off with a wired local area network (LAN) which has been upgraded to provide a robust fibre optic network backbone with Wi-Fi connectivity. Over a period of five years from 2009 to 2014 the university has also increased its bandwidth from a mere 1 Mbps to the current 380 Mbps. This internet connectivity was improved from a simple dial-up connectivity, through dedicated lines, radio link, satellite and the current optic fibre connectivity. This has resulted in faster internet connectivity that gives users easy access to internet services and access to electronic resources. The lecturers interviewed registered their satisfaction with the speed of the internet and the quality service they received.

1.2.2 Provision of Computers

MSU started with two computer laboratories with 40 computers each. One of the laboratories was used for staff and student training in basic ICT skills. The other lab was available for use by both students and staff outside learning time. Since 2009 the university has had a phenomenal increase in the number of computers for student use. Furthermore, the university has adopted the bring-your-own-device (BYOD) concept to improve on student's access to computers. BYOD has resulted in large numbers of computing devices including laptops, tablets, computers and smart phones being added to the university campus wide network by both lecturers and students for teaching and learning purposes. These computers are supported by university technicians, who help the students with hardware and connectivity problems that are faced by users who bring their own devices. This has seen the student to computer ratio improving from 10: 1 to almost 1:1.

1.2.3 E-learning Portal

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

The MSU e-learning portal (eMSU) was developed and launched in 2005 with an average of twenty lecturers. To date, out of the 492 lecturers 393 are active users of the platform. This portal functions as a learning management system (LMS) for learning content and assessment feedback. Lecturers upload lecture materials such as presentations, lecture notes, handouts and links to online resources. The portal allows lecturers to link up with their students through discussion forms, instant messaging and live chats. In addition to learning content and materials, students also obtain their semester results and fees statements from the portal.

1.2.4 Lecturer training

MSU introduced lecturer training in both technology and pedagogical skills through the Postgraduate Diploma in Tertiary Education (PDTE). This course is meant for all lecturers who are teaching without teaching qualification. In addition to the foundations of education and teaching principles, the course offers training in instructional technology where issues of e-learning and technology integration, instructional design, sound teaching and learning practice are dealt with. Interviews with the gradaunts from this programme revealed that this course has helped in building capacity and confidence among lecturers to use technology in their teaching. The level of confidence, commitment and motivation among lecturers has been increased. The lecturers are now committed to continuous improvement in the use of technology in their teaching. During interviews, lecturers would not hide their feelings of ownership, pride and competence towards their use of technology in their teaching. In addition, the university offers tailor-made workshops to deal with capacity building, accessing e-learning resources, internet searching, presentation packages and Turnitin among others.

1.2.5 Library support

The university library is one of the key actors in the e-learning network at MSU. The library has an electronic resources section that allows both students and lecturers to access internet based teaching and learning resources. Through the electronic library section the university subscribes to 19 e-book collections and 52 e-journal databases. In addition, the library has an institutional repository which is a collection of all research output by lecturers and students in the university. The library also offers training on internet surfing and how to access e-resources. The training supports the link between lecturers and e-learning materials. Lecturers noted that through this training they were able to gain confidence in using the electronic resources that are available. During the period (2 years) when the actors were followed, a Google analytic report shows that there were 393 users and of these 252 were new users of the use electronic resources.

Table 2: Type of e-learning users

No.	User type	Acquisition			Behaviour		
		Session	% New Section	New users	Bounce rate	Pages/ session	Average session Duration
		1 038	**62.14**	**393**	**25.63**	**8.04**	**00:07:36**
1	New Visitor	393	100	393	22.95	8.44	00:07:25
2	Returning Visitor	252	0 00	0	30.03	7.39	00:07:53

These users were interacting with e-journals and e-books collections as shown in tables 3 and 4 below.

 ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

Table 3: Rate of use of e-journals

No.	e-Journal Database	Total Events	Unique Events
		6,717(44.51%)	**3,842 (51.81%)**
1	Emerald Insight	1,409 (20.98%)	1,047 (19.54%)
2	JSTOR Journal Storage	913 (13.59%)	737 (13.76%)
3	Ebscohost	749 (11.15%)	583 (10.88%)
4	Proquest Central	315 (4.69%)	229 (4.27%)
5	Sage Journals Online	285 (4.24%)	225 (4.20%)
6	Taylor and Francis Online	279 (4.15%)	219 (4.09%)
7	Wiley Online Library	216 (3.22%)	165 (3.08%)
8	Agora	107 (1.59%)	61 (1.14%)
9	Oxford Journals	101 (1.50%)	75 (1.40%)
10	Sabinet African Online Journals	83 (1.24%)	69 (1.29%)

Table 4: Rate of use of e-book collection

No.	e-Book database	Total Events	Unique Events
		6,451 47.50%	**3,142 47.53%**
1	e-Brary	2,012 (31.19%)	1,389 (29.95%)
2	Ebscohost	959 (14.87%)	611 (13.17%)
3	e-Book Library	806 (12.49%)	603 (13.00%)
4	Emerald Business Management and Economics Collection	638 (9.89%)	367 (7.91%)
5	Safari Business Books Online	454 (7.04%)	331 (7.14%)
6	Dowsomera	413 (6.40%)	323 (6.96%)
7	Proquest Central	150 (2.33%)	131 (2.82%)
8	African Digital Library	135 (2.09%)	113 (2.44%)
9	Project Muse e-Books	108 (1.67%)	81 (1.75%)
10	Google Books	56 (0.87%)	49 (1.06%)

1.2.6 Institutional Policies

Policies usually create awareness amongst staff and students about the need to adopt e-learning. The University Senate has passed a number of policies that guide the use of various ICT resources, such as University ICT Policy, Open Access policy and Institutional Repository Policy. The Institutional Repository policy has improved the link between lecturers and e-electronic resources, with lecturers not only acting as consumers of information, but as pronsumers who are able to upload their conference and research papers. The institutional repository policy together with the Intellectual Property policy addressed

ISSN 2223-7062 Proceedings and report of the 7th UbuntuNet Alliance annual conference, 2014, pp 83-98

lecturers' concerns about intellectual property rights and these policies have persuaded lecturers to upload their research output without the fear of losing their intellectual property rights.

Related to policies, the other actants which come to play in the e-learning actor network at MSU are the various university committees, such as Computer committee, Website committee and the Library committee. For example, the computer committee has enacted a computer replacement policy which ensures that old computers are replaced at the rate of 300 computers per semester. This has seen new state-of-the-art computer hardware being introduced in the university. The new computers have encouraged lecturers to use the internet since they now no longer face challenges of delays due to slow processing speed.

1.2.7 Technological Support

The role of the Information Technology Services (ITS) department at MSU is to maintain a robust network backbone and to ensure that university computers are in good working order. In addition the department offers technical and training support to both lecturers and students. Lecturers and students are given training in basic ICT skills to enable them to be able to use computers comfortably. Users are also assisted in troubleshooting and solving hardware problem on their personal computers. Basic ICT training is assumed in the training that is offered by the electronic resource library section.

1.2.8 University administration

According to Shraim, (2010)) it does not matter whether the academic staff has the interest, or that technology is in place: if there is no political will, nothing will change. The university administration becomes one of the conspicuous actors in the e-learning through their political will. They become conspicuous actors through the policies and committees that are in place to guide the rolling out of the e-learning programme. The MSU administration's commitment to e-learning is reflected by the Vice Chancellor's keen interest in ICT issues. The ITS director reports directly to the Vice Chancellor on issues of ICT development in the university. ICT is one of the university's Key Result Areas (KRA) which is monitored through the Results Based Management system. The ICT purchasing committee, which is responsible for buying computers and related hardware is also under the Vice Chancellor's office. This has facilitated the purchase of computers and related hardware such as projectors, whiteboards and relevant e-learning software.

2. Moments of translation and changing e-learning perceptions

This section is an assemblage of the traces that were felt by the actors described above as they traversed the MSU e-learning trajectory. Callon's moments of translation provide useful vocabulary that is used to describe how lecturers were translated by the associations between them and the other actors they interacted with each other in the e-learning programme. The first stage of an ANT translation is problematisation. At this stage the principal actors define the problem to be solved by the network to emerge from the association of the targeted actors. At MSU the primary actors include the university administration, faculty deans and departmental chairpersons. These are members of Senate, the highest decision making body on academic issues. These actors enact policies that guide the rolling-out of the e-learning programme. The strategic plan of the university was presented to Senate and through senate departments weretasked to come up with action plans on how they were going to implement the university's vision of making e-learning the principle mode of instruction. A common understanding of what constitute e-learning at MSU was reached and each department

produced a results based management (RBM) plan to guide the lecturers in department to implement e-learning.

The acceptance of the goal of the university to embrace e-learning as a principle mode of instructional delivery and student learning was the obligatory passage point (OPP) for entering the emerging network.The OPP is that point where all the actors involved need to pass to satisfy their interests and the university's interests. For this case, OPP was related to the university policies, training and technology. With regard to policies, it was necessary that the university drafted policies that would provide direction as to how the university wanted its e-learning programme to progress. Training was required to build capacity and expertise among lecturers to implement the e-learning programme. Technology infrastructure and internet connectivity was needed facilitate the use of internet for teaching and learning.

With the Deans at faculty level and Chairpersons at department level as principal actors, interessement of other lecturers was sought. In this second moment of e-learning translation, the focus is on the actor-network building and how actors seek alliances that share same interests. MSU Strategic Plan (1999 – 2005) provided some direction on the development of e-learning by stating the role of ICT in University teaching and learning. The strategic plan initiated the institutionalisation process by defining the mandate of university lecturers to coordinate processes and by recognizing the need to build capacity with regard to technology resource and training. Lecturers' interessement was therefore carried out through efforts made by the Faculty of Education and the Library to convince them that e-learning was the best option in as far as university teaching and learning was concerned. Hence the Faculty of Education and the university library play crucial roles in training and building e-learning awareness. These efforts helped to lock into place all the actors who had passed the OPP, so that their reciprocal relations are invested by some interest.

These targeted actors needed to be enrolled into the e-learning actor network. The enrolment started by the approval of MSU e-learning programme by Senate. Through coordination and alignment of interests, a common ground and multiple networks of alliances are produced, when actors accept the roles assigned to them by the principal actors. The actors identify themselves with the problem solution. This leads to the final stage of the translation in which the network starts to speak as one, and starts to operate as a recognisable actor. Departments now claim the ownership of the programme. This resulted in the commitment from the policy maker and practitioner to work together for the programme's success. Lecturers now feel engaged and are actively involved in the programme as indicated by the Google Analytic report on their usage of electronic resources as well as their participation in e-learning portal discussion forums.

As programme networks grow, more resources will be needed. Through institutionalisation, the e-learning programme is getting funding from the University's central budget to cover operational cost and infrastructural development. Policies such as computer replacement and policy ensures that computer hardware is kept up-to-date. The BOYD principle has relieved the university from the pressure exerted by the increased demand for computers from both lecturers and students. The university is now focusing on providing a robust network backbone and bandwidth to ensure unlimited access to internet and electronic resources.

At the initial stages of the e-learning there were challenges which included problems with lecturers and students who had low skills in using computers and the e-learning platform. Most lecturers and students were using computers for the first time and had not had any formal training in the use of ICT for teaching and learning respectively. To mitigate this challenge, MSU introduced ICT training for both lecturers and students. Special face-to-face training in basic ICT skills and pedagogical skills were conducted to help lecturers to build their confidence in the use of e-learning technology in their teaching.

6. Missing Relationships

The scenario described above does not imply that everything is connected. Some disconnections in the e-learning programme were identified. The analysis revealed some missing links between assessment and evaluation as agents of improvement to the e-learning programme. Assessment and evaluation should be viewed as actors which can be used to destabilise the black boxed actor network so that new cycles of translation can be initiated to improve on the e-learning programme. Furthermore, the e-learning programme has basically remained transmissionist rather than the recommended constructivist model of teaching. As opposed to the transmissional model, constructivists model describe learning as the innovative and participative process that can be enhanced through e-learning platforms. The continued use of the transmissional model instruction points to mistier between the pedagogical training and the methods of teaching employed by lecturers. Training has focused much on ICT skills which together with other actants such as increased bandwidth, access to high quality computers have significantly changed the perception of lecturers of the value of e-learning in their teaching.

7. Discussion

To understand the implementation of e-learning by lecturers and how their perceptions can be positively changed, we need think of e-learning as networks of heterogeneous actors. E-learning should be viewed as a socio-technical network that comprise of computers, networkapplications, learning material, learners, and lecturers among other actors. The significance of the ANT's concept of network is in its continually negotiated processes where both human and nonhuman actors have a mutual and causal influence in network processes (Toumi, 2001).According to Toumi (2001) each actor can only be viewed in relation to, and not separate from other actors or parts of the network. These actors assume identities according to prevailing strategies of interaction (Hanseth & Monteiro, 1998) and should be mutually engaging and supportive of each other. Looking at e-learning through ANT lens therefore requires us to recognise the negotiating interplay between the human and nonhuman actors in the e-learning environment. We should focus our attention on exploring the actors' practices, looking for relations, associations or ties they make. Technology can no longer be taken for granted, we may not view technology as just a neutral passive thing, but as one of the principal actors which need to be treated at the same analytical level with humans. One major contribution of ANT to explaining the change in lecturer's perception is symmetrical power that the technological developments and the human capacity development as actants can exert similar levels of influence on each other to bring about the required change.The ANT description of the results of this study helps us to understand the multiplicity of influences throughout e-learning translation at MSU. That is, to say e-learning translation is an active collective creation process. The active e-learning actor network grows enrolling actors and translating them in what they want and reify their translation in such a way that none of them can desire anything else any longer. When they are turned from being technophobic to being technology savvies, the actors enter into a state of flow with regard to the use of e-learning. When actors get into a flow state, they become absorbed in their activities and might be unable to recognize changes in their surroundings. This will be time to open the black box with the aim to improve the system.

8. Conclusion

The change in lecturers' perceptions may be viewed as a result of the associations created by heterogeneous actors in a network of aligned interests which results in a stable network. Lecturers need to be e-enabled to take advantage of the use of technology by creating an interactive environment including a clear policy for raising awareness, training program and improving infrastructure. However for sustained use of e-learning issues of accessibility and connectivity and other technical issues should be treated as temporary issues and emphasis should be on e-learning as a networked process rather than as a tool. To ensure translation of lecturers from being technophobic to technology savvies, e-learning approach should be part of a systematic integration of technology into the learning processes of the university rather than an imposed project.

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Biography

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